DOCUMENT RESUME

ED 209 453 CE 030 431

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TITLE Validate an Occupational Analysis. Professional Preparation Module. Vocational Teacher. X-1.
INSTITUTION Temple Univ., Philadelphia, Pa. Div. of Vocational Education.
SPONS AGENCY Pennsylvania State Dept. of Education, Harrisburg. Bureau of Research and Evaluation.
PUB DATE 1 Jun 81
CONTRACT 85-9825
NOTE 47p.; This module is a revised version of ED 192 158. For related documents see CE 030 432-437, ED 192 053-068, and ED 192 154-159.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Behavioral Objectives; *Competency Based Teacher Education; Individualized Instruction; *Job Analysis; Learning Activities; Learning Modules; Program Administration; Program Implementation; *Validity; *Vocational Education; *Vocational Education Teachers

ABSTRACT

This module is one in a series of seven focused on skills vocational teachers need to develop and manage programs that are performance-based and fully individualized. Designed to allow for individualization of a teacher education program, these modules supplement those prepared by the National Center for Research in Vocational Education for professional development of vocational teachers. The objective of this module is to help develop skill in validating existing occupational analyses. (Analysis is a process through which the skills, knowledge, and attitudes needed for successful employment are identified.) Focuses are on the process used to establish a program's scope, development of skills needed to revise existing analyses, and verification of a revised occupational analysis. Contents include three learning experiences based on three enabling objectives that provide background information, practice experiences, or a combination. Completion of these experiences should lead to achievement of the terminal objective in the fourth and final learning experience with teacher performance assessment form. Each learning experience includes a learning activity (activities) with information sheets, case studies, and self-checks with model answer (as feedback). Optional activities may also be provided. (YLB)

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ED209453

X-1
VALIDATE AN OCCUPATIONAL ANALYSIS
Revised 6-1-81

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CONTRACT 85-9825

CE030431

Professional Preparation Module

Vocational Teacher

INTRODUCTION

For the most part, vocational education has been offered in a limited number of occupations which are relatively prestigious, require long periods of training, and can be institutionalized rather easily to serve people at or near the age of compulsory education. Given the ever-increasing changes in our technological society, the recent emphasis on manpower development, and the current involvement of state agencies in vocational education, the scope of vocational education can be expected to change rapidly.

There are well-established procedures by which vocational education can maintain its relevance in a changing society. For one thing, it can make use of information about the employment situation provided by the federal and state employment offices. For another, it can survey local business and industry as well as people in the local community to determine local employment opportunities and the willingness of local people to participate in programs designed to prepare them for employment.

Once the need for specific educational programs has been established and there is evidence that people are willing and able to enter them, the programs must be developed. The development of vocational education programs has always been based on the information obtained through conducting an occupational analysis. Through an occupational analysis, the skills, knowledge, and attitud needed for successful employment are identified.

Over the years, many occupations have been analyzed and the results are available to the interested educator. However, there are many emerging occupations yet to analyze and, due to changes in occupations, all existing analysis must be brought up-to-date to have utility.

This module was developed to help you become competent to validate existing occupational analyses. You will be made aware of the process used to

determine a program's scope and develop the skills needed to revise existing analyses. You will also learn how to verify your work and thus produce a valid occupational analysis.

FORWARD

This module is one in a series focused on the skills vocational teachers need to develop and manage programs that are performance-based and fully individualized. Modules in this series should be used to supplement those prepared by The National Center For Research in Vocational Education for the professional development of vocational teachers.

This series of modules was developed in direct response to Pennsylvania Vocational Education Program Compliance Standards which, among other things, demand that programs be performance-based to serve the occupational needs and interests of each enrolled student.

The need for developing a special series of modules was recognized by Dr. Carroll Curtis of the Bureau of Research and Evaluation Pennsylvania Department of Education and, through the financial support of his office, these modules were developed.

The modules were reviewed by Dr. Ruth Armstrong and Dr. Robert Elingler which led to changes in this edition of the series. Changes were also made on the bases of feedback received from certain or the more than 200 Vocational Teachers who used the modules during the 1980-81 academic year. The assistance of all who were involved in this effort is gratefully acknowledged.

Richard A. Adamsky
Project Director

ABOUT THIS MODULE

Objectives:

Terminal Objective: While working in an actual school situation, validate an occupational analysis. Your performance will be assessed by your Resource Person, using the Teacher Performance Assessment Form, pp. 41-42 (Learning Experience IV).

Enabling Objectives:

1. After completing the required reading, demonstrate knowledge of the process involved in establishing the scope of a vocational program (Learning Experience I).
2. After completing the required reading, revise an existing occupational analysis (Learning Experience II).
3. After completing the required reading, verify a revised occupational analysis (Learning Experience III).

Prerequisites:

To complete this module, you must have an operating occupational advisory committee or access to one in your occupational specialty. If you find that you have access to an operating committee you will need the ability to use it. If you do not have access to a committee, you will need ability to set one up. In effect, you will need the competencies addressed in the following modules:

- A4 organize an occupational advisory committee
- A5 maintain an occupational advisory committee

Resources:

A list of the outside resources which supplement those contained within the module follows: check with your Resource Person (1) to determine the availability and the location of those resources, (2) to locate additional references in your occupational specialty, and (3) to get assistance in setting up activi-

ties with peers or observations with skilled teachers, if necessary. Your Resource Person may also be contacted if you have any difficulty with directions, or in assessing your progress at any time.

Learning Experience I

Optional:

A vocational administrator or curriculum supervisor you can interview concerning the process used to identify the occupations to be included within the scope of a vocational program. Reference: U S. Department of Labor, Bureau of Employment Security. Dictionary of Occupational Titles Volumes I and II, 1965 (or more recent edition).
Reference: U.S. Department of Labor, Bureau of Labor Statistics. Occupational Outlook Handbook, current edition.

Learning Experience II

Required: .

One or more completed occupational analysis to review.

Learning Experience III

Required:

An operating occupational advisory committee that will assist you in the verification process and incumbent workers to provide the information used to verify an occupational analysis.

Learning Experience IV

Required:

An actual school situation in which you can validate an occupational analysis.

A Resource Person to assess your competency in validating an occupational anaylsis.

LEARNING EXPERIENCE I

OVERVIEW

Enabling Objective: After completing the required reading, demonstrate knowledge of the process involved in establishing the scope of a vocational program.

Activity: You will be reading the information sheet, Program Scope, pp. 8-12.

Optional Activity: You may wish to meet with a vocational administrator or curriculum supervisor experienced at using information to establish the scope of a vocational program.

Optional Activity: You may wish to examine the Dictionary of Occupational Titles or the Occupational Outlook Handbook.

Activity: You will be demonstrating knowledge of the process used to establish the scope of a vocational program, by completing the Self-Check, p. 14.

Feedback: You will be evaluating your competency by comparing your completed Self-Check with Model Answers, p. 15-16.

Activity: For information concerning the establishment of the scope of a vocational program, read the following information sheet:

PROGRAM SCOPE

The Dictionary of Occupational Titles (D.O.T.) lists some 22,000 occupations in which people are employed. Some require extensive preparation and others require little or none prior to job entry. Some occupations are closely related in that workers require similar knowledge and skill whereas others are not.

When developing a vocational program, the developer must consider many things. The most important of these is whether the program will be sufficiently broad to insure that graduates can find employment but appropriately narrow to insure that graduates have the skill and knowledge needed to hold employment.

In general, a vocational program is developed around several occupations which are related, which requires some preparation for entry. When the decision has been reached as to which occupations the program will focus on, the scope of the program has been set.

Establishing the scope of a program is no easy job nor is that of redefining program scope. Such efforts must involve school administration, an occupational advisory committee, and, as in the case of program scope redefinition, the vocational teacher. The vocational teacher should understand the process used to establish the scope of a program and, to the degree possible, take an active role in the process.

The Process of Establishing the Scope of a Vocational Program

The process to be described must be ongoing if the scope of each vocational program is to reflect the continually changing business-industrial community and

the educational needs and interests of local people. The program scope must recognize that employment opportunities that exist today may not tomorrow, that the vocational interests of people are in constant flux, and that the resources present in a community at one point in time may not be always available. Changing conditions demand that vocational programs be continually checked for relevance and cost-effectiveness.

The steps in the process discussed below are not to be considered sequential. Actually, they should be ongoing.

Determine Employment Opportunities - It would make little sense to develop a vocational program that focused on one or more occupations in which sufficient employment opportunities did not exist now or would not exist in the near future. Also, there is little to suggest that many program graduates will be willing to leave their community to find employment in other states or regions. For these reasons, the scope of a program must be based on a knowledge of employment opportunities available now and in the near future within a well-defined geographic area.

A labor market survey within the defined region can provide information as to the occupations in which employment opportunities exist. Local employers can also project their needs for the future. When such information is coupled with information reported by various governmental agencies, a fairly accurate picture of the future can be drawn. Such publications as the following are invaluable when establishing the scope of a vocational program: 1) The Occupational Outlook Handbook and its companion periodical the "Occupational Outlook Quarterly", 2) the Manpower Report of the President, and 3) the Dictionary of Occupational Titles.

Determine Community Interests - A vocational program must be established to serve people. If there are few people interested in being prepared for the

occupations within the scope of a vocational program, the program cannot be justified.

A community survey should be conducted on a regular basis to determine if people would enroll in vocational programs if they were offered. Naturally, not all who express interest will enroll. However, such information is helpful when making the decision as to which occupations to include in a vocational program since it reflects the feeling of the community toward that program.

A student follow-up survey is also a valuable technique to use when redefining the scope of a program. When it is found that students are unable to find employment in certain occupations or unable to hold employment in others due to a lack of knowledge and skills, then scope adjustments are usually needed. Such follow-up information is collected from the students and from those who employed them.

Determine Available Resources - The scope of a vocational program is significantly influenced by local resources. For instance, a change in program scope may require new and expensive equipment, alterations to existing facilities, or a different vocational teacher. For these reasons, a vocational administrator must consider labor market needs and community interest with consideration of the resources available at the time change seems needed. Unfortunately, there are times when the only action possible is to make no change.

Define the Program Scope - As stated previously, the scope of a vocational program is considered to be the occupations to be included within the program. Once the decision is made as to which occupations are to be included, the scope of the program should be described. This is accomplished through the use of the Dictionary of Occupational Titles (D.O.T.) and the Occupational Outlook Handbook (O.O.H.).

The program description should include the titles of the occupations within the program's scope, the code number for each occupation, and a brief narrative which includes:

- the skills needed
- the knowledge needed
- employment conditions
- physical requirements for workers
- common tools and equipment used
- anticipated changes in the occupations
- licensing requirements, if any
- opportunities for advancements, if any

Given the decision to include certain occupations within a program, the task of preparing the program description is quite easy. The writer can review the description for each occupation that is presented in the D.O.T. and the information presented in the O.O.H. to develop a composite of the information found. For example, suppose the decision had been reached to include two occupations within an Alteration Specialist Program, 1) seamstress and 2) alteration tailor. In looking up these titles in the D.O.T. and examining the outlook for workers in the textile service industry, the writer developed the following program description:

Program: Alteration Specialist

Occupations: Seamstress (D.O.T. Code Number 782.884)

Alteration Tailor (D.O.T. Code Number 785.281)

Two of the occupations within the textile service industry are the dressmaker (seamstress) and the bushelman (alteration tailor). These skilled workers perform their duties under a supervisor who will usually take care of customer fitting problems as well as supervise sewing room operations themselves.

The dressmaker who does alterations performs a wide variety of sewing operations such as hemming garments, resewing seams, and removing and replacing zippers. The bushelman usually performs the same task on the heavier fabrics such as those used in trousers, suitcoats, and topcoats. The head bushelman or dressmaker will handle garments that come under the heading of Plant Damage or which have a major sewing problem.

Both worker classifications require the use of industrial type sewing machines and these workers must have good eyesight. Much of the recent expansion in this industry has taken place in foreign countries but the field is expected to remain constant through 1982.

Optional Activity: ⇨ You may wish to arrange through your Resource Person a meeting with a vocational administrator or curriculum supervisor experienced at using information to establish the scope of a vocation program. During this meeting you could:

- discuss what procedures are followed to collect the information from which program scoping is accomplished.
- discuss the information analysis techniques used to determine the scope of a program.
- discuss the impact of local resource availability on decision making.
- ask to see one or more program descriptions that were prepared locally.

Optional Activity: ⇨ You may wish to arrange through your Resource Person to get copies of the Dictionary of Occupational Titles and the Occupational Outlook Handbook for review. When reviewing these publication, you might:

- Read the introductions which explain how they are used.
- Project the future of your occupational specialty.
- Consider which occupations are related within your occupational specialty.

Activity: The following items check your comprehension of the material in the information sheet, Program Scope, pp. 8-12. Each of the items require a short essay-type response. Please explain fully, but briefly, and make sure you respond to all parts of each item.

SELF-CHECK

1. How might you work with school administration and your advisory committee during the revision of the scope of your program?

2. Why must the scope of vocational programs be continually scrutinized?

3. What effect does the availability of resources have on establishing the scope of a vocational program?

4. What information should be considered when developing a program description?

Feedback: Compare your written responses on the Self-Check with the Model Answers given below. Your responses need not exactly duplicate the model responses; however, you should have covered the same major points.

MODEL ANSWERS

1. The vocational teacher should seek active involvement in the process used to establish or redefine the scope of a program. There are several aspects of the process in which the teacher could provide valuable assistance. For instance, helping the administrator develop survey instruments and analyze the information collected. He or she could accept responsibility to prepare the program description. The offer to help in the process would be well received and go a long way toward accomplishing the task as smoothly as possible.

2. The scope of all vocational programs should be continually examined so that each reflects the occupations in which employment opportunities exist, those that local people have interest in entering, and the availability of resources.

3. The scope of a vocational program is highly related to the resources available. It cannot include occupations that the school cannot afford nor can an occupation be offered without an appropriately prepared teacher.

4. The description should include the program title and the title and code number of each included occupation. In addition, a brief

narrative should explain such things as the skill and knowledge needed in these occupations, the common tools and equipment used by workers, the employment conditions, the anticipated changes in the occupations, and any special physical or licensing requirements.

LEVEL OF PERFORMANCE: Your completed Self-Check should have covered the same major points as the Model responses. If you missed some points or have questions about additional points you made, review the material in the information sheet, Program Scope, pp. 8-12, or check with your Resource Person if necessary.

LEARNING EXPERIENCE II

OVERVIEW

Enabling Objective: After completing the required reading, revise an existing occupational analysis.

Activity: You will be reading the information sheet, Locate, Review, and Revise an Occupational Analysis, pp. 18-23.

Activity: You will be preparing an initial listing of the duties, tasks, and steps in a specific occupation.

Feedback: You will be evaluating your competency in revising an existing occupational analysis, using the Initial Listing Checklist, pp. 25-26.

Activity: For information concerning how to locate, review, and revise an occupational analysis, read the following information sheet:

LOCATE, REVIEW, AND REVISE AND OCCUPATION ANALYSIS

Each occupation requires workers to have specific skills and it is through conducting an analysis of an occupation that these skills are identified. In effect, an analysis must be conducted for each occupation within the scope of a vocational program or there would be little chance of the program being effective (graduating competent workers).

In recent years, a number of private and public agencies have recognized the need to analyze occupations and the results of these efforts are often available to the interested vocational educator. For this reason, it is recommended that vocational educators only engage in conducting their own occupational analysis when the possibility of locating a completed one has been eliminated. This suggestion is based on the time and effort needed to complete an analysis. Such an investment in time and effort would be better spent locating an existing analysis and revising it as needed.

Locating an Occupational Analysis

The quickest way for a Pennsylvania vocational educator to locate any needed materials is through VEIN (Vocational Education Information Network) at Millersville State College. A phone call to (717) 872-3477 is usually all that is needed. The educator need only state his or her need for an analysis of a particular occupation; and, if it can be located by VEIN Resource Persons, the analysis will be supplied without cost. It should be pointed out, however, that

the materials requested may be in the form of microfische which could not be reviewed without the use of a special reader. Such readers can be found in many local schools and at most college and university libraries.

The materials available through VEIN are varied; and those associated with an occupational analysis may come from:

> The National Center for Research in Vocational Education. The Center is located in Columbus, Ohio and is associated with The Ohio State University. As the clearinghouse for Vocational Education, the Center is responsible for the dissemination of materials having relevance to vocational educators. The Center has published a three volume Directory of Task Inventories which is a compilation of analyses performed by numerous agencies.
>
> The Vocational-Technical Education Consortium of States (V-Tecs). V-Tecs headquarters are located in Atlanta, Georgia. This consortium of 16 states has joined together to conduct occupational analysis in many occupational areas. Since Pennsylvania is a member state, vocation educators have access to all completed analyses through VEIN.

Reviewing an Occupational Analysis

The utility of each analysis located varies as a function of when it was prepared and the procedures followed in its preparation. Some, unfortunately, are very old and/or poorly prepared and must be discarded in favor of "starting from scratch." Typically, even recent analyses of very technical occupations will be found to have little utility due to the ever increasing rate of change in such occupations.

In reviewing an analysis, the first important consideration is its focus; was it prepared for a single occupation or for several? For instance, V-TECS analyses normally focus on several occupations but indicate which worker skills belong with each occupation. The utility of an analysis would be somewhat limited if it did not differentiate between occupations when two or more are included in the analysis.

The next thing the reviewer must consider is how each skill is stated. The essential thing here is not whether the skill is called a task, a duty, a

job, or an operation. What is essential is whether or not the statements describes observable and measurable worker behavior. For instance, "give back rub" and "replace muffler" describes worker behavior, "sectioning" or "offset printing" does not. Also essential in this same regard is that the statement deal with worker rather than student behavior. An analysis is done of an occupation not a vocational program. For example, statements such as "arrives in class on time" or "completes all homework assignments" describes appropriate student behavior, but is unwarranted in an occupational analysis.

Technical occupations are difficult to analyze and seldom are there usable analysis to be found. The problem seems to be related to the small number of tasks actually performed by workers as compared to the great amount of technical knowledge involved in appropriate performance. A well-prepared analysis of such an occupation would, of necessity, consist of fewer skill statements than those occupations requiring less technical knowledge. For example, a welder needs less technical knowledge to perform with skill than does an electronics technician. Yet, an analysis of both occupations would reveal that there are many more observable and measurable elements of behavior involved in being a welder than in being an electronics technician.

A brief review of one or more completed analyses should indicate their potential as an alternative to conducting an analysis of the occupations included within a vocational program.

Revising an Occupational Analysis

The terms used in conjunction with occupational analysis seem to vary but, since Pennsylvania is a member of V-TECS, the terms used in the consortium are most appropriate to use. For our purposes, the terms mean:

> Domain. Each V-TECS catalog embraces one or more D.O.T. listed occupations. The occupations listed are considered to be the domain being analyzed. If the catalog domain corresponds to the occupations to be included in a vocational program, the domain and the program scope would be identical.

Duty. Each occupation can be subdivided into major and distinct units of work. Each unit is considered a duty. For instance; performing engine overhaul is a distinct unit of auto mechanics which, in turn, embraces 3 occupations, 1) auto mechanic, 2) auto service mechanic, and 3) auto mechanic helper.

Task. Each duty can logically be subdivided into units of work needed to fulfill the intent of the duty statement. For instance, an auto mechanic might find it necessary to replace a muffler when engaged in performing an engine overhaul. "Replace a muffler" is a task statement.

Step. Each task can be further subdivided into units of performance needed to fulfill the intent of the task statement. In V-TECS, the steps, when grouped, are referred to as the performance guide. For instance; an auto mechanic wanting to replace a muffler, as part of an engine overhaul, would find it necessary to 1) raise the vehicle on suitable lift or stand, 2) remove the clamps and hangers from the tail-pipe, etc.

Substep. Although V-TECS makes no mention of substeps and although it is not generally recommended that an analysis go further than the step level, a further subdivision may be needed to aid teachers responsible for the preparation of people with severe learning problems. For instance, the step "raise vehicle on suitable lift or stand" could be further subdivided into 1) select a jack, 2) position a jack, 3) check jack stability, etc.

Once one or more analyses have been obtained, reviewed, and judged potentially useful, the following things must be done.

1. Organize into Hierarchy. The materials obtained may have been prepared by V-TECS. If such is the case, they would already be organized in the manner herein advocated. If such is not the case, they must be organized into a hierarchical structure, i.e., duty with accompanying task with accompanying steps (and, if desired, substeps). The V-TECS example given below illustrates the orgainization structure advocated:

Duty: Painting and Refinishing

Task: Remove Paint and Rust

Steps:
1. Inspect work requirment
2. Select sandblaster or grinder
3. Obtain necessary safety equipment
4. Use sandblastor or grinder to remove paint and rust

Organizing existing materials may be difficult in that they may refer to steps as tasks or tasks as steps. For this reason, there are some general guidelines to apply to each statement in an analysis. By applying the guidelines, it is possible to properly classify each statement.

A Duty Statement. As stated earlier, such a statement must describe a major and distinct unit of work. Such statements often end in "ing" or could be revised to end in "ing". In addition, duty statements can be grouped into work performance duties and supervisory duties. In the former case, the statements might begin as follows; performing, maintaining, trouble shooting, repairing, replacing, adjusting, or installing. Supervising duties could begin as follows; supervising, organizing, planning, directing, implementing, training, inspecting, or evaluating.

A Task Statement. The task is a subdivision of a duty. Each task statement must begin with an action word (a verb) and be followed by the object on which action is to be taken. For example; repair fuel pump, clean wound, install circuit breaker. It is generally advised that only one verb be included in a task statement and that two statements be made out of a statement with two verbs. It is also recommended that modifying phrases not be included in a task statement unless such is essential. For example, check fuel system for cleanliness may be a better task statement with the modifying phrase included. However, a phrase such as "for proper functioning" would not be used.

A Step Statement. Few analyses go as far as to list the steps followed to perform a task. In this regard, V-TECS is the exception. However, many analyses have steps and tasks listed as tasks. In making a judgment as to whether to clasify a statement as a task or a step, the following rule can be followed: A task statement should differentiate between the different occupations and between people functioning at different levels in the occupation (manager, supervisor, foreman, and worker). A step statement does not allow for such differentiation unless a total sequence of steps are present (the task itself).

2. Check Eack Task Statement. The task statement is an essential part of the analysis since it best describes the skills needed by workers in an occupation. For this reason, the statements must clearly communicate what it is that the worker does. Therefore, each should be checked against the following criteria:

A Task Statement Must-

1. Be brief but clearly understood by a worker in the occupation (no more than two lines).

2. Written using words consistent with those used in the occupation.

3. Describe rateable human "on the job" behavior.

4. Begin with a present tense verb with the subject "I" understood to precede the verb. ("I" replace fuel pump, "I" type business letter).

5. Be a complete sentence rather than an action statement followed by a series of objects ("type the following kinds of letters a) business, b) personal").

A Task Statement Must NOT-

1. Include abbreviations.

2. Include words with different meanings to people within the occupation.

3. Make use of long words or expressions when shorter alternatives exist.

4. End with a period.

5. Make use of "and/or" or "etc".

6. Be too general. For example; repair transmissions should be rewritten to 1) repair automatic transmissions and 2) repair manual transmissions.

3. Check Each Step Statement. The criteria used to check task statements equally apply to step statements. In general, they must be short descriptions of what is done on the job written in words a worker understands.

Activity: Locate and obtain an analysis and, after reviewing it, select a simple occupation within the scope of your occupational speciality. Then, using the analysis already reviewed, revise the analysis in hierachical order, e.g.,

1. The occupation title and code number (D.O.T.)
2. A duty statement (one of several)
3. A task statement (one of several)
4. The steps involved (several)

The above example should be duplicated for each duty and task performed in the occupation being analyzed.

Note: If this activity is performed for simulation purposes, an analysis of only one duty statement would suffice.

Feedback: After you have revised an analysis in hierarchical order, use the Initial Listing Checklist, pp. 25-26, to evaluate your work.

INITIAL LISTING CHECKLIST

Direction: Place an X in the None, Partial, or Full Box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A. Box.

Name

Date

Resource Person

	LEVEL OF PERFORMANCE			
	N/A	NONE	PARTIAL	FULL
1. After the revision, the analysis was centered on a single occupation and organized in hierarchical form				
2. The revised duty statements				
a. contained action words ending in "ing" accompanied by object words, e.g., repairing engines, maintaining turf grass				
b. include both supervisory and work performance activities				
3. The revised task and step statements				
a. were brief and easily understood by those employed in the occupation . .				
b. made use of words that are associated with the occupation				
c. did not include abbreviations				
d. began with a present tense verb and included an object word				
e. were not too specific or general . .				
4. By itself, a revised step statement could not be used to determine				
a. the specific occupation being analyzed				
b. the level of employment (workers, supervisory) associated with performance				

LEVEL OF PERFORMANCE: All items must receive Full, or N/A responses. If any item received a None, or Partial response, review the material in the information sheet, Locate, Review, and Revise an Occupational Analysis, pp. 18-23, revise your inventory accordingly, or check with your Resource Person if necessary.

LEARNING EXPERIENCE III

OVERVIEW

Enabling Objective: After completing the required reading, verify a revised occupation analysis.

Activity: You will be reading the information sheet, The Verification Process, pp. 28-37.

Activity: You will be verifying an occupational analysis that you previously revised.

Feedback: You will be evaluating your competency in verifying a revised occupational analysis, using the Verification Process Checklist, pp. 38-39.

Activity: For information concerning the steps followed to verify a revised occupational analysis, read the following information sheet.

THE VERIFICATION PROCESS

The way a business or industrial concern organizes its work force is influenced by many factors. In some, workers are very specialized and, in others, they must have a wide range of skills. This being the case, the initial listing, developed through using existing analyses, must be verified. Stated differently, it must be shown to be a valid reflection of local business and industrial practices. The verification process has four steps.

Step 1 - Initial Review

The first step in the verification process seeks to improve the degree to which duty and task statements communicate to others and to bring them more in line with local practices. This is accomplished by having several incumbent workes review the initial listing.

Reviewers should represent several rather than a single local business or industrial concern and also represent both the worker and supervisory level in the occupation being considered. It is recommended that there be from three to nine reviewers and that the review take place at a time when all can be present. It is further recommended that the occupation advisory committee help in identifying reviewers but not be considered the review team.

Prior to the review, the revised aalysis should be reorganized to reduce the time needed to conduct the review. First, a single listing of all duty

statements should be prepared. Next, a listing of each duty with associated tasks should be made. During this review, the steps involved in peforming a task should not be considered.

The review itself, if focused on a single occupation, should not take long. After informing the reviewers of the procedures to be followed, the review begins with an examination of the duty statements. The reviewers are guided through the list and asked:

1. Is this duty performed in the occupation identified?
2. Does the wording of the duty statement accurately describe the duty as you know it?
3. What other duties are performed in this occupation?

Once the changes, if any, have been noted, each duty, with associated tasks, is examined. Here the reviewers are guided by the following questions:

1. Is each task listed with the correct duty?
2. Are there tasks missing for the duty involved?
3. Should certain tasks be deleted?
4. Does the wording of the task statement accurately describe the task as you know it?
5. Does the task belong with this occupation? If not, with what occupation should it be listed?

Based on the suggestions made during the initial review, the materials are revised and arrangements are made for pilot testing them.

Step 2 - The Pilot Test

A pilot test of the revised materials is conducted to determine if they fully communicate. Stated differently, will incumbent workers be able to read a duty or task statement and understand what is being stated?

The reviewers involved in the pilot test should be equivalent to those involved in the initial review. They should number from three to nine, repre-

sent both the supervision and worker levels, and be from more than a single business or industrial concern. Here again, the occupational advisory committee can be of assistance in identifying persons to be involved in the pilot test.

The Pilot Test can be conducted through a group meeting, individual interviews, or by sending the materials through the mail. In effect, the reviewer need only answer two questions:

1. Does each statement make sense to you as it's written?
2. How might it be worded to make more sense?

Step 3 - Incumbent Workers Survey

The next step in the verification process is to determine if the revised listing accurately reflects local business and industrial practices and to determine the degree to which the occupation involved differs within the community being served. This step in the process involves collecting information from many, if not all, persons engaged in an occupation within a community; and, therefore, the assistance of the occupation advisory committee and school administration is essential.

There are a number of different ways to identify those from whom information might be collected. For instance, through employee or employer organizations or through direct contact with employers themselves. The choice of a particular method would depend largely on the size of the community to be surveyed and the number of persons within the community working in the occupation.

Once it has been decided who will be involved in the survey and how they might be contacted (through employer or directly), a decision must be reached regarding the method to use to collect needed information, e.g., through a mailed questionnaire or interview. Each method has particular strengths and

weaknesses and advice as to which to use should be solicited from the occupational advisory committee and school administration.

An important consideration is what information to collect. Obviously, there is a need to know whether or not each duty and task is performed. However, this could vary by company and employee; and, therefore, the collection of additional information seems essential.

The Incumbent Worker Survey instrument (Figure 1), which follows, would provide enough information to verify the revised listing. Accompanied by a cover letter and directions, it could be used as a mailed survey instrument. It could also be used during an interview with workers or as a check-off sheet when workers are being interviewed on the job.

If the instrument is to be mailed, a set of directions must be provided. The directions should explain to a worker how to respond to each task and when a response is not needed. An example of such directions follows:

Directions:

The incumbent worker survey instrument calls for you to respond to each task listed in terms of what you currently do -- your occupation. Do not respond to tasks that you have never performed nor to tasks that are not performed by you in your present job (title you hold in this company). Note that your job title need not correspond with the "occupation" stated near the top of the survey instrument.

Please respond in this order:

1. Complete the top of the survey instrument (name, etc.)
2. Beginning with the first duty statement (under occupation), go down each task listed. As you go down the tasks, circle the number before each task you perform as part of your present job.
3. If there are other tasks that you perform that, in your opinion, belong with the duty statement, you may add them in the blank spaces provided.

INCUMBENT WORKER SURVEY

YOUR NAME _____ COMPANY NAME _____

YOUR JOB TITLE _____ TOTAL EMPLOYEES _____

YEARS IN PRESENT JOB _____ NUMBER OF EMPLOYEES HAVING YOUR JOB TITLE ____

OCCUPATION:

DUTY:

NO.	TASK	PERFORMED BY BEGINNERS?		DIFFICULT TO LEARN?		HOW OFTEN IS THE TASK PERFORMED PER .. (ANSWER IN ONLY ONE BLOCK)				HOW IMPORTANT FOR ENTRY INTO THE OCCUPATION			IS TASK IMPORTANT FOR ADVANCEMENT IN THE OCCUPATION		
		YES	NO	YES	NO	DAY	WEEK	MONTH	YEAR	VERY	SOME	NONE	VERY	SOME	NONE

32

33

34

FIGURE 1

4. Now respond to each task you perform by indicating a) whether or not it is performed by those considered new (beginners) in your job, b) if it was difficult for you to learn the task, c) how often you now perform the task, and d) how important the task is to those just entering the occupation.

5. When you complete the first duty and associated tasks, move on to the next and follow steps 2-4.

When instruments are to be mailed to incumbent workers, they must be accompanied by a cover letter explaining the need for survey and that it is being sponsored by vocational education and other employer/employee groups (if possible). In Figure 2, a sample cover letter is presented.

It is suggested, that a follow-up letter be sent to those who do not respond to the survey instrument within two weeks. In effect, the follow-up letter simply reminds the worker of the need for his/her cooperation and states that another survey instrument will be provided if needed.

TREVOSE COUNTY AVTS

Mrs. Carol Adams
Fashion Beauty Shop
53 Main Street
Carlton, PA

Dear Mrs. Adams:

Trevose County AVTS is currently involved in a major effort to analyze several occupations that employ county residents. As a cosmetologist, your assistance is needed.

Enclosed you will find the "Incumbent Worker Survey" instrument with directions that is being sent to every licensed cosmetologist in the county. Please take the time from your busy schedule to complete the instrument and return it to us in the stamped self-addressed envelope that is also included.

The Pennsylvania Board of Cosmetology is jointly sponsoring this survey, and it has been estimated that it would take approximately 30 minutes to complete. The information that you and others provide will be used to help us at Trevose AVTS develop a cosmetology program centering on the skills needed to succeed in this occupation.

Sincerely,

Jon Johnson, Instructor
Cosmetology Department

Figure 2

Step 4 - Information Analysis

After the survey has been completed, information has to be organized and then analyzed. In effect, there is only one question that must be answered: do the task statements reflect current business and industrial practices as they exist in this community? However, the information could be used to answer several other questions.

Figure 3, which follows, shows a tabulation of information collected from 100 incumbent auto mechanics relative to a single duty and 10 tasks associated with it (A-J). As is shown, the workers added 3 tasks bringing the total to 13. In all categories except that dealing with how often the task is performed, the numbers indicate how many persons responded to one or another of the choices provided. In the other category, the numbers indicate the calculated average of what the workers stated to be "How often the task was performed." An ideal way to demonstrate analysis procedures would be to analyze the information included in Figure 3.

Based on the information provided by these 100 workers, it is clear that all 10 tasks included in the survey were being performed by them, some on a daily basis and others less frequently. In fact, the survey picked up 3 additional tasks performed by a small number of workers. It would appear that earlier work was quite productive and that a valid listing of tasks (for this duty) now exists.

In terms of planning a vocational program, the information also reveals that there are only 8 tasks that 25 percent or more of the workers indicate to be needed by beginners; tasks A, C, D, E, H, J, and No. 11 (write in). It also reveals, that tasks A, D, E, and J are very important upon entry into employment, that most of these tasks are performed frequently, and that most are difficult to learn. It follows, that they definitely would have to be learned prior to job entry.

OCCUPATION: XXX

DUTY: XXX

NO.	TASK	PERFORMED BY BEGINNERS?		DIFFICULT TO LEARN?		HOW OFTEN IS THE TASK PERFORMED PER (ANSWER IN ONLY ONE BLOCK)				HOW IMPORTANT FOR ENTRY INTO THE OCCUPATION			IS TASK IMPORTANT FOR ADVANCEMENT IN THE OCCUPATION		
		YES	NO	YES	NO	DAY	WEEK	MONTH	YEAR	VERY	SOME	NONE	VERY	SOME	NONE
1	A	100	0	25	75	3.1	15.0	62.0	0	90	10	0	0	50	50
2	B	15	85	80	20	0	0	5.5	15.0	5	10	85	10	80	10
3	C	75	25	70	30	0	3.0	5.5	0	20	50	30	40	60	0
4	D	100	0	20	80	9.1	12.2	0	0	90	5	5	0	50	50
5	E	90	10	15	85	1.1	5.6	7.1	0	60	40	0	10	30	60
6	F	0	100	75	20	0	0	3.2	7.0	0	0	100	100	0	0
7	G	1	99	100	0	0	4.0	7.0	0	0	1	99	100	0	0
8	H	50	50	60	40	5.2	12.3	0	0	20	30	50	25	28	42
9	I	25	70	30	75	10.1	17.0	0	0	5	20	75	70	30	0
10	J	99	1	75	20	1.0	3.0	3.0	0	90	10	0	0	90	10
11	WRITE IN	2	0	2	0	2.2	0	0	0	0	2	0	0	0	2
12	WRITE IN	0	5	5	0	0	3.0	4.0	0	0	0	0	0	5	0
13	WRITE IN	0	10	8	2	3.0	5.1	0	0	0	0	0	5	5	0

FIGURE 3

A further analysis of the 5 tasks not performed by beginners reveals that they are all important for advancement on the job but that only two (I and No. 13) are performed frequently. One might well conclude that these tasks need not be included in a vocational program unless they were offered as optional rather than required skills, to learn.

The data in Figure 3 could be organized differently to answer other questions as well. For instance, it could be organized by company size (number of employees) or by respondent experience in the occupation being analyzed. Such a reorganization of data could help determine if the size of an organization influences whether or not certain tasks are performed by beginners or more experienced workers. Similarly, the reorganization by experience could reveal different work patterns as a function of experience in the occupation. In general, the number of additional questions that can be answered through information reorganization is only limited by the resourcefulness of the analyist.

Activity: ⬆ Verify the analysis that was previously revised (Learning Experience II). This would require you to work with school administration and an occupational committee.
Note: If this activity is performed for simulation purposes, the validation process need only center on a single duty statement and accompanying tasks (a follow through with the simulated activity in Learning Experience II).

Feedback: ⬅ After you have verified a revised occupation analysis, use the Verification Process Checklist, pp. 38-39, to evaluate your work

VERIFICATION PROCESS CHECKLIST

Directions: Place an X in the None, Partial, or Full Box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A Box.

Name

Date

Resource Person

	LEVEL OF PERFORMANCE			
	N/A	NONE	PARTIAL	FULL
In conducting an initial review of a revised occupation analysis, the teacher:				
1. Involved the occupational advisory committee				
2. Involved incumbent workers at both the worker and supervisory level				
3. Reorganized materials into a list of duty statements and a composite list of duty and associated tasks . .				
4. Prepared incumbent workers to fulfill their review functions				
In conducting a pilot test of the revised occupational analysis, the teacher:				
5. Involved the occupational advisory committee				
6. Involved incumbent workers at both the worker and supervisory level . .				
7. Established statements which clearly communicated				

	LEVEL OF PERFORMANCE			
	N/A	NONE	PARTIAL	FULL
In preparing for the incumbent worker survey, the teacher:				
8. Involved the occupational advisory committee				
9. Involved school administration. . . .				
10. Identified the incumbent worker population				
11. Selected the survey sample				
12. Developed survey instrumentation (or questionnaire)				
13. Developed a cover letter and follow-up letter				
In conducting the incumbent worker survey, the teacher:				
14. Followed-up non-respondents				
In analyzing the information from the incumbent worker survey, the teacher:				
15. Determined which tasks should be considered entry-level				
16. Determined which tasks should not be considered valid for a vocational program				

LEVEL OF PERFORMANCE: All items must receive Full, or N/A responses. If any item receives a None, or Partial response, review the material in the information sheet, The Verification Process, pp. 29-38, or check with your Resource Person if necessary.

LEARNING EXPERIENCE IV

FINAL EXPERIENCE

Terminal Objective:

While working in an actual school situation, validate an occupational analysis.

Activity:

At a time when you find it necessary to develop a vocational program or scrutinize an existing one, validate an occupational analysis. This will include:

- Determining the scope of the program involved
- Reviewing existing analysis of the occupation involved
- Revising existing analysis
- Verifying the revised results

Note: As you complete each of the above activities, document your actions (in writing, on tape, through a log) for assessment purposes.

Feedback:

Arrange in advance to have your Resource Person review your documentation and observe you (live or on tape) work with incumbent workers.

Your total competency will be assessed by your Resource Person, using the Teacher Performance Assessment Form, pp. 41-42.

Based on the criteria specified in this assessment instrument, your Resource Person will determine whether you are competent in validating an occupational analysis.

TEACHER PERFORMANCE ASSESSMENT FORM

Directions: Indicate the level of the teacher's accomplishment by placing an X in the appropriate box under the level of Performance heading. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A Box.

Name

Date

Resource Person

	LEVEL OF PERFORMANCE					
	N/A	NONE	POOR	FAIR	GOOD	EXCELLENT
1. Each occupation included within the program scope was identified by D.O.T. title and number prior to the teacher beginning the revision process						
2. A written description of the program was prepared which included:						
a. the occupation involved (scope) . . .						
b. the skills and knowledge needed by workers (general)						
c. common tools and equipment used by workers						
d. employment conditions and anticipated changes in the occupation . .						
e. licensing requirements and physical requirements for employment.						
3. Prior to beginning the revision process, the teacher reviewed existing analysis completed for the occupation within the problem scope						
4. During the revision, the teacher applied appropriate criteria to each duty, task, and step statement						
5. After revising the occupational analysis, the teacher verified the results by:						
a. conducting an initial review with incumbent workers.						
b. conducting a pilot test with incumbent workers						
c. conducting a survey or interview with incumbent workers						

	LEVEL OF PERFORMANCE					
	N/A	NONE	POOR	FAIR	GOOD	EXCELLENT
6. During the verification process, the teacher involved the occupational advisory committee						
7. Upon completion of the verification process, the teacher was able to identify the job entry skills to be included within the program scope						

LEVEL OF PERFORMANCE: All items must receive N/A, Good, or Excellent responses. If any item receives a None, Poor, or Fair response, the teacher and Resource Person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the work area(s).

ABOUT USING MODULES IN THIS SERIES

Organization

Each module is designed to help you gain competency in a particular skill area considered important to teaching success. A module is made up of a series of learning experiences, some providing background information, some providing practice experiences, and others combining these two functions. Completing these experiences should enable you to achieve the terminal objective in the final learning experience. The final experience in each module always requires you to demonstrate the skill in an actual school situation when you are an intern, a student teacher, or an in-service teacher.

Procedures

Modules are designed to allow you to individualize your teacher education program. You need to take only those modules covering skills which you do not already possess. Similarly, you need not complete any learning experience within a module if you already have the skill needed to complete it. Therefore, before taking any module, you should carefully review (1) the Introduction (2) the Objectives listed on p. 3, (3) the Overviews preceding each learning experience, and (4) the Final Experience. After comparing your present needs and competencies with the information you have read in these sections, you should be ready to make one of the following decisions:

- that you do not have the competencies indicated, and should complete the entire module
- that you are competent in one or more of the enabling objectives leading to the final learning experience, and thus can omit experience(s)
- that you are already competent in this area, and ready to complete the final learning experience in order to "test out"
- that the module is inappropriate to your needs at this time

When you are ready to take the final learning experience and have access to an actual school situation, make the necessary arrangements with your resource person and arrange (1) to repeat the experience, or (2) complete (or review) previous sections of the module or other related activities suggested by your resource person before attempting to repeat the final experience.

Options for recycling are also available in each of the learning experiences preceding the final experience. Any time you do not meet the minimum level of performance required to meet an objective, you and your resource person may meet to select activities to help you reach competency. This could involve (1) completing parts of the module previously skipped; (2) repeating activities; (3) reading supplementary resources or completing additional activities suggested by the resource person; (4) designing your own learning experience; or (5) completing some other activity suggested by you or your resource person.

TITLES OF MODULES IN THE "X" SERIES

X-1 Validate An Occupational Analysis

X-2 Prepare Valid Performance Objectives

X-3 Develop A Module For Individualized Instruction

X-4 Arrange For The Improvement Of Vocational Facilities For Individualized Instruction

X-5 Establish An Ends Oriented Grading System

X-6 Provide Students With Individualized Assistance

TITLE OF CHANGE AGENT MODULE

Assist Vocational Education Personnel Move Toward Full Adoption of Performance-Based Vocational Education